**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

In re: REMBRANDT TECHNOLOGIES, LP
PATENT LITIGATION

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MDL Docket No. 07-md-1848 (GMS)

JURY TRIAL DEMANDED

REMBRANDT TECHNOLOGIES, LP'S OPENING CLAIM CONSTRUCTION BRIEF ON THE "EIGHT PATENTS"

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I.   INTRODUCTION & BACKGROUND

The eight Rembrandt patents in suit relate to cable modems and systems. Two patents (5,852,631 and 5,717,761) relate to improved ways of establishing connections between two communication devices, e.g., in a cable modem system; four patents (6,950,444; 5,880,903; 4,937,819 and 5,719,858) relate to improved data transmission in a cable modem system; and two patents (6,131,159 and 5,778,234) relate to improvements for updating software (firmware) in modems.[1]

Rembrandt suggested twenty-eight non-means plus function claim terms for construction from these eight patents. Defendants insisted on construction of over one hundred non-means plus function terms.[2] Defendants requested construction of many short phrases (including some proposed by Rembrandt), and then also requested construction of longer claim phrases that include those already-requested shorter phrases. Defendants' proposed constructions are improperly restrictive and overly complicated, and their proposal to inundate the Court with over one hundred mostly redundant terms needlessly complicates and enlarges the *Markman* process. Rembrandt believes that the parties' actual disputes could be resolved more efficiently with far fewer claim terms construed by the Court.

Rembrandt properly and consistently construes the claim terms as required by the law – in accordance with their plain and ordinary meaning and based on the intrinsic evidence. Defendants, in contrast, repeatedly commit a self-serving "cardinal sin of patent law—reading a limitation from the written description into the claims." *SciMed Life Sys. v. Advanced Cardiovascular Sys*., 242 F.3d 1337, 1340 (Fed. Cir. 2001). The Court should reject Defendants'

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[1] The '631, '819 and '858 patents were asserted in Texas against defendant Comcast. *Rembrandt v. Comcast*, 2:05-cv-00443-TJW ("the Texas case"). The court issued a Markman ruling, which this Court vacated. Docket #9. The Markman ruling and Rembrandt's briefing from the Texas case are included in the Joint Appendix. Rembrandt did not include Comcast's briefing as it was filed under seal, but did include Comcast's objections to the Markman ruling, which were not filed under seal. *See* R 1-135.
[2] The Joint Claim Chart reflects which party or parties proposed a particular term for construction. Rembrandt's proposed terms are italicized, and those proposed by Defendants are underlined.

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overly narrow and needlessly complicated constructions in favor of those offered by Rembrandt.

II.   LEGAL STANDARDS

The purpose of claim construction is to "determin[e] the meaning and scope of the patent claims asserted to be infringed." *Markman v. Westview Instruments, Inc.,* 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc), *aff'd* 517 U.S. 370 (1996). Claim construction is a matter of law. *Id.* at 970-71.   Intrinsic evidence—the patent claim language, the specification, and prosecution history, considered in this order of importance—is the primary source of guidance as to the meaning of the claim terms. *See Vitronics Corp. v. Conceptronic, Inc.,* 90 F.3d 1576, 1582-83 (Fed. Cir. 1996). "[T]he claim construction inquiry . . . begins and ends in all cases with the actual words of the claim." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998) (citations omitted). "Generally this court gives claim terms their ordinary and customary meanings, according to the customary understanding of an artisan of ordinary skill at the time of the invention." *Finisar Corp. v. DirecTV Group, Inc*., 523 F.3d 1323, 1328 (Fed. Cir. 2008). "The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (en banc) (citation omitted). "[T]his court has consistently adhered to the proposition that courts cannot alter what the patentee has chosen to claim as his invention, that *limitations appearing in the specification will not be read into claims*, and that interpreting what is *meant* by a word *in* a claim 'is not to be confused with adding an extraneous limitation appearing in the specification, which is improper.'" *Intervet Am., Inc. v. Kee-Vet Lab., Inc.*, 887 F.2d 1050, 1053 (Fed. Cir. 1989) (first emphasis added; citation omitted).

An element of a claim may be expressed using a "means-plus-function" description – i.e., as a means for performing a specified function. 35 U.S.C. §112, ¶6. Construing means-plus-

function limitations is a two step process. First, the Court must identify the claimed function. *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 1113 (Fed. Cir. 2002). In doing so, "[t]he court must construe the function of a means-plus-function limitation to include the limitations contained in the claim language, and only those limitations." *Id.* Second, the Court must determine what structure in the specification corresponds to the claimed function. *Id.* "In order to qualify as corresponding, the structure must not only perform the claimed function, but the specification must clearly associate the structure with performance of the function." *Id.*

III.   THE PROPER CONSTRUCTION OF THE DISPUTED TERMS

A.   The '631 Patent (R 195-203)[3]

The '631 Patent describes and claims a method and system to reduce the time required for two communication devices (e.g., modems) to establish communication with one another. The complement of procedures carried out to effect efficient and orderly communications between communication devices are conventionally divided into a hierarchy or stack of "layers". Each layer provides a unique set of functions necessary to effect the desired communications. Each layer generally depends on or uses functionality of the layers below it in the hierarchy, and each layer provides functionality to the layers above it. In a taxonomy known as the Open Systems Interconnect (OSI) Reference Model, the two lowest layers are known as the "physical layer" and the "link layer." The lowest layer – the "physical layer" covers electrical and physical aspects of the devices' connections. The next layer—the "link layer" covers the transfer of data between the devices, including detection, and possibly correction, of transmission or reception errors. 1:21-54;[4] 11:29-36; 2:60-3:15. R 139-141, ¶¶ 16-21.[5]

Because different modems may support different protocols, it is necessary for two

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[3] Refers to Rembrandt's Table of Constructions.

[4] Citation to #:# indicates column and line numbers for the particular patent being discussed, which will be included in the Joint Appendix. Thus, for example, 1:56-57 refers to Column 1, Lines 56-57. Except where otherwise noted, all emphasis in quoted materials is added.

[5] The declaration of Professor Kevin Almeroth is submitted as part of the Joint Appendix, and specific paragraphs therein shall hereafter be referred to as R __, ¶ #.

modems to "negotiate" which protocols they will use to communicate with each other. Prior to the invention of the '631 Patent, two devices that needed to negotiate communication protocols would first negotiate the protocols needed to establish a physical layer connection, and then would have to negotiate again (in a second full negotiation) to establish a link layer connection (one layer "up" from the physical layer). The inventors of the '631 Patent realized was that in many cases two full negotiations were unnecessary. In particular, they realized that if the physical layer negotiation revealed that both modems supported a particular physical layer modulation, the link layer negotiations could be avoided. 11:44-46. One innovation detailed in the '631 patent, exemplified by claim 1, increases the efficiency of the connection sequence between two devices by establishing a protocol for the data link layer based on an already-established physical layer modulation, thereby eliminating the need for a separate negotiation regarding the link layer protocol.

The '631 patent is not limited to any particular type of physical equipment or network connection, and nothing in the '631 patent limits its scope to any type of protocol or telecommunications standard. Defendants, nevertheless, repeatedly proffer constructions that would restrict the claims to specific networks using specific types of modem technology operating with specific standards. These transparent attempts to unduly limit the scope of the patent should be rejected.

1.   **The Calling and Answering Modems Should Not be Limited to those operating on a Telephone Network or under any "standards"[6]**

Rembrandt's proposed constructions of these two terms are based upon their plain meaning and are consistent with the intrinsic evidence. R 141-42, ¶¶ 22-25. Defendants improperly seek to limit the scope of the claims by adding requirements that are simply not

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[6] Defendants request construction of the terms "calling modem" and "cable modem" (in the Texas case the meanings of these terms was not disputed).

present in the claim language or required by the patent. Defendants have taken various examples from the specification and insert these examples as limitations into the claims–contrary to legal precedent, and despite the fact that the '631 description specifically states that it refers to a preferred embodiment and should not be limiting. 3:63-4:4. For example, Defendants propose that the "modem" be limited to modems "operable with ITU V. standards." Defendants' constructions also improperly require that the calling and answering modems communicate over a *telephone* network, or that the physical layer protocol be limited to "a *telephone network* standard."

Expressly contrary to Defendants' added limitations, however, the '631 specification makes clear that the claimed inventions may employ a variety of protocols and different types of networks. 1:34-36, 42-46, 55-61; 2:12-17, 32-38; 55-60; 4:20-24. Thus, the specification identifies the TCP/IP protocol, a non-telephone network protocol, as an <u>exemplary</u> protocol that could be used. 1: 31-47.[7] The TCP/IP protocol was designed for computer communication and is used for communications over the Internet, and was well-understood at the time the '631 patent was filed to operate over many types of networks in addition to telephone networks. R 142-43, ¶¶ 26-27. In addition, Figure 1 of the '631 patent shows modem 28 connected to both an IP network and a PSTN network, and notes that Fig. 1 shows "a system illustrating multiple modems intercommunicating through a variety of mediums, including cellular and PSTN." 4:20-24.

2. Physical Layer/Link Layer & Related Terms

Rembrandt's constructions neither expand nor contract the scope of the claims, but seek to construe the claim language as understood by one of ordinary skill in the art. For example, Rembrandt's constructions of "establishing a link layer connection between a calling

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[7] The '631 patent specification is explicit throughout that what is described therein is only by way of example: 3:65- 4:4; 6:16-19; 11:30-32; 11:52-55; 14:15-20.

modem…and an answering modem" and "establishing said link layer connection based upon said negotiated physical layer modulation" make clear that a network connection is "established" in a particular layer by applying parameters that govern communication through that layer. R 144-45, ¶¶ 28-29. In addition, the specification teaches that "negotiating" may include the "exchange [of] parameters that identify the modems, and thus, their communications protocol" which "synchronizes the modems for communication in accordance with the same standard protocol. . ." 6:31-36.

Defendants repeatedly seek to narrow the claims by proposing limitations not found in the claim language or mandated by the specification. For example, in the claim terms "physical layer modulation" and "establishing a link layer …", Defendants improperly limit the claim scope to networks established over telephone lines. As discussed in Section III.A.1, no such limitation exists in the patent. Defendants once again try to import the word "standard[s]."

With respect to the claim terms "wherein said physical layer connection …." and "establishing said link layer ….", Defendants improperly import a requirement that the modems identify parameters for the physical and link layers by defaulting to settings pre-established in the modems themselves. This limitation, however, is found in dependent claim 4. Under the principles of claim differentiation, it would be incorrect to read this limitation into claims other than dependent claim 4. *See Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1380 (Fed. Cir. 2006).

Rembrandt's construction for "physical layer" is drawn directly from the definition propounded in the article setting forth the OSI Reference Model, specifically referenced in the patent specification. 1:49. This original and authoritative definition states that the physical layer "provides the mechanical, electrical, functional, and procedural characteristics to establish, maintain, and release physical connections." R 127. Similarly, the IEEE Dictionary published

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near the time of the invention defines " physical layer" as " the layer of the ISO Reference Model that provides the mechanical, electrical, functional, and procedural characteristics [to] access . . . the transmission medium." R 120.

The IEEE Dictionary (published the same year as the patent's effective filing date) defines "link layer" as the "layer of the ISO reference model that provides the functional and procedural means to transfer data between stations (i.e., modems), and to detect and correct errors that can occur in the physical layer." R 119. Rembrandt proposes that the Court adopt this definition, substituting "modems" instead of "stations" for clarity. The Court should reject Defendants' attempt to selectively pluck portions of the IEEE definitions.

Defendants' constructions also try, incorrectly, to impose temporal or ordering requirements or limitations on types of data transfer that do not exist in the claims. *Baldwin Graphic Sys. v. Siebert, Inc.*, 512 F.3d 1338, 1345 (Fed. Cir. 2008) ("[A]lthough a method claim necessarily recites the steps of the method in a particular order, as a general rule the claim is not limited to performance of the steps in the order recited, unless the claim explicitly or implicitly requires a specific order."). In their construction of the claim terms "establishing a link layer connection …." and "establishing said link layer connection ….", Defendants propose a requirement, unsupported by any claim language, that the connection be established "without transferring data bytes" and "before the modems can transfer data bytes." Defendants' pattern of inserting improper claim limitations continues with their proposals that the physical layer be established "upon completion of training and start-up, before any link layer connection is established" and that it must be established by using "communication techniques different from data byte transfer," which are without foundation in the '631 patent claims. Instead, the claim language requires only that the physical layer be established "based on a negotiated physical layer modulation chosen from said first and second physical layer modulations." 14:32-36.

3. **Means Plus Function Claims for Establishing Connections in the Physical and Link Layers.**

Both parties seek construction of these means-plus-function terms: (1) "means for establishing a physical layer connection between said calling and said answering modems" and (2) "means for establishing said link layer connection based upon said negotiated physical layer modulation." The parties agree on the function set out in the first term: "establishing a physical layer connection," and Rembrandt has properly listed the structure necessary to perform the recited function. Defendants, in contrast, improperly pack their proposed construction with voluminous unnecessary elements from various parts of the patent disclosure.

The only structure needed to establish a physical layer connection is a control processor programmed to perform the steps of identifying and applying a commonly supported physical layer communication protocol between the calling and answering modems. 2:64-3:15; 2:65-4:5; 4:20-24; 5-5:42-44; 6:30-36; 11:35-46; 12:62-13:22; 12:37-41. R 145-46, ¶¶ 30-32. Defendants seek to add unnecessary structures that perform functions other than "establishing a physical connection," including listening to, and creating frequency tones in, both the calling and answering modems. *Id.* Defendants again seek to import a limitation that would restrict the claims to applications using telephone lines as the communications medium, which should be rejected.

As to the term "means for establishing said link layer …", Rembrandt proposes a function description that is based on the plain language of the claim, i.e., "establishing the link layer connection based upon the negotiated physical layer modulation." The only structure necessary to "perform the link layer connection is programmable hardware configured to perform the step of establishing link layer parameters to default values that are based upon the previously negotiated physical layer modulation." 11:39-46; 12:55-13:41. R 146-47, ¶¶ 33-34.

Defendants' proposed construction also adds the limitation that the calling modem be

restricted to a PSTN or cellular modem where these limitations -- just like the improper references to a telephone network -- are not necessary to the claimed function.

4.   The word "Logic"

Claim 10 of the '631 patent describes a computer program product that has "computer program logic recorded thereon." Claim 10 includes the word "logic" in the two claim terms: "logic for establishing a physical layer connection …" and "logic for establishing a link layer connection …" "Logic" as it is used in these claims means computer code (*see*, *e.g.*, the claim preamble: "computer program logic") that, when executed, performs the described task. 13:58-14:10. R 147, ¶¶ 35-36. One skilled in the art, reading this claim, would understand that computer code, when executed, establishes both the physical and link layer connections. *Id.* This disclosure of the structure (i.e. the code) does not trigger "means plus function" analysis claims under 35 USC §112, ¶ 6. Where claim language does not include the word "means," a rebuttable presumption is triggered that § 112(6) <u>does not</u> apply. *See Lighting World, Inc. v. Birchwood*, 382 F.3d 1354, 1358 (Fed. Cir. 2004); *3Com Corp. v. D-Link Sys., Inc.*, 473 F. Supp. 2d 1001, 1017 (N.D. Cal. 2007) (holding that the term "logic" in the claim language at issue in that case did not invoke 35 U.S.C. § 112(6)). "[T]he presumption flowing from the absence of the term 'means' is a strong one that is not readily overcome." *Lighting World, Inc.*, 382 F.3d at 1358. Nothing rebuts the "strong" presumption that § 112(6) does not apply to this claim.

B.   The '761 Patent (R 203-206)

The '761 Patent relates to improved ways of establishing connections between two devices, e.g., in a cable modem system. Because different modems may support different protocols, communication between modems generally requires that they "negotiate" which protocols they will use for their communication. The "negotiation" of a protocol for a particular connection does not imply that the connection is established – establishment of a connection

using a negotiated protocol may be a separate step. As also described above, a connection between two modems takes place at various layers within a hierarchy of layers.

Exemplary claim 1, describes (a) negotiating a physical layer of a data connection to determine a set of parameters for the physical layer; and (b) selection of an "error control negotiation sequence" as a function of a value of at least one parameter of the physical layer.

1. Error Control

Defendants' proposed construction improperly adds three unfounded and unsupported limitations to the claim term:

1. "protocol standards": Defendants again try to inject the term "standard" (discussed in Section III.A.1) into the claims, despite the fact the '761 patent makes no mention that it is limited to (or covers) any standard. The terms "protocol" and "standard" both ignore the specific teaching of the '761 patent – that an approach to error control may be to do nothing. 4:12.

2. "LAPM, MNP, or Buffer": Defendants' proposed construction improperly adds limitations to the claim from *examples* presented in the specification – even though the specification disclaimed these examples as non-limiting. The specification discusses LAPM, MNP, and Buffer because these were the "types of error control protocols used [when the patent was filed]." '761: 1:18-20. The specification makes clear that "[t]he foregoing [examples in the specification] merely illustrate[] the principles of the invention and it will thus be appreciated that those skilled in the art will be able to devise numerous alternative arrangements which, although not explicitly described herein, embody the principles of the invention and are within its spirit and scope." *Id.* at 4:40-45. The '761 inventions are not limited to modems, but instead "[t]he present invention relates to *data communications equipment*, e.g., modems. . . ." '761 at 1:5-6 (emphasis added). Because LAPM, MNP, and Buffer are applicable only to modems and

not to data communications equipment in general, it would be improper to read that limitation into the claim. R 147-48, ¶¶ 37-38.

       3.   "in existence as of May 31, 1995": The Court should reject Defendants' invitation to limit the scope of "error control" to the link layer error control protocol standards in existence as of any particular date, e.g., May 31, 1995. Nothing in the intrinsic evidence supports such a limitation; indeed, the above quoted provision contradicts this unwarranted limitation.

2.   Error Control Negotiation Sequence/Sequences

Rembrandt's construction is consistent with the intrinsic evidence and with its definitions of other terms (e.g., "error control"). Defendants' construction of "error control negotiation sequence" includes a number of limitations that are found nowhere in the intrinsic evidence or in the language of the asserted claims and are instead additional attempts to improperly import examples from the specification as claim limitations. First, the claim language is not limited to "error control protocols," which is the focus of Defendants' construction. Second, Defendants' construction adds ambiguity by using a term, "error control protocols," that is undefined.

3.   A Physical Layer for a Data Connection

The parties' constructions of the term "physical layer" do not reference standards or temporal limitations. Without any basis, Defendants argue that when the term "physical layer" is used in the phrase "a *physical layer* for a data connection" it should be limited to: (1) an ITU V industry standard (e.g., V.22, V.22bis, V.32, V.32 bis, V.34);   (2) in existence as of May 31, 1995. These two limitations, then, must be derived from the words "for a data connection" because they were not included in Defendants' definition of "physical layer."

Defendants' proposed construction improperly attempts to limit this term to specific physical layer protocols mentioned in the specification and in existence as of May 31, 1995. None of the claims, however, contain limitations related to specific physical layer standards or

temporal limitations, thus making it inappropriate to import such limitations into the claim terms. Not even the embodiments described in the specification are limited to specific physical layer industry standards or to those standards in existence as of a certain date. '761 Patent 3:49-51. The specification makes clear that the inventions in the '761 patent are not limited to modems, but instead "[t]he present invention relates to *data communications equipment*, e.g., modems. . . ." '761 Patent at 1:5-6. Because the ITU V. physical layer industry standards are applicable only to modems and not to the broader category of data communications equipment, it would be improper to limit the claim terms to the ITU V. physical layer industry standard.

4.   "To Determine a Set of Parameters for the Physical Layer of the Data Connection with the Far End Data Communications Equipment"

Defendants' construction of the term "to determine a set of parameters for the physical layer of the data connection with the far end data communications equipment." Rembrandt believes that this term should have its plain and ordinary meaning as understood by a person of ordinary skill in the art: "to identify a set of parameters to be used for the physical layer [already defined] of the data connection between two data communication devices." R 148-49, ¶¶ 39-40.

Defendants again attempt to import limitations not found in the claim language nor required by the specification. Defendants' proposed construction adds a *temporal limitation* on the claim language ("before error control") that is not supported. This temporal limitation is not part of the claim language. *See Baldwin Graphic Sys.*, 512 F.3d at 1345 ("[A]lthough a method claim necessarily recites the steps of the method in a particular order, as a general rule the claim is not limited to performance of the steps in the order recited, unless the claim explicitly or implicitly requires a specific order."). Moreover, the temporal phrase "before error control" does not make sense when read in conjunction with Defendants' proposed construction of "error

control"[8] and would only serve to confuse the jury. Defendants also add the limitation that the "negotiated physical layer standard is used to determine the physical layer parameters," but that limitation is nowhere in the claim language. Again, Defendants improperly inject the word "standard" into the claim term (see discussion above III.A.1).

5.   Selecting One of a Number of Error Control Negotiation Sequences …

Defendants request construction of the term "selecting one of a number of error control negotiation sequences as a function of a value of at least one parameter from the set of parameters for the physical layer" (claim 1 of the '761 Patent). Notably, this term includes at least two other terms whose construction is requested, including "error control," and "error control negotiation sequences." Rembrandt's proposed construction carefully incorporates terms that have already been construed separately so as give the claim terms different scope. In other words, Rembrandt's constructions makes sense when read with the proposed constructions for the other terms in the '761 Patent. However, Defendants' proposed construction only creates confusion when inserted into the claim language because it does not account for the terms within the phrase that are being construed separately. Defendants' proposed construction again adds limitations not found in the claim language. Their proposed construction states, "*after* . . . determining the physical layer parameters . . .,*" but the claim does not require that the negotiation sequence be selected *after* all physical layer parameters are determined. '761, Fig. 2.

C.   The '444 Patent (R 206-210)

The '444 patent relates to enhancements in the transmission of data. Some communication devices, such as, e.g., modems, transmit information in bursts of data, sometimes called frames. Between bursts of information, there is transmission "silence." The term

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[8] Inserting Defendants' proposed construction of "error control" into their construction for this term yields an incomprehensible construction: "before *link layer error control protocol standards (LAPM, MNP, or Buffer) in existence as of May 31, 1995*, the negotiated physical layer standard is used to determine the physical layer parameters of the data connection."

"silence", however, does not necessarily mean that there is nothing on the line, only that there is no data being transmitted. For example, interference on a line may cause noise (both during and between transmissions). A device expecting a data transmission needs to be able to distinguish the silence (e.g., noise on the line) from the start of an actual data transmission. Accordingly, each frame includes a preamble (a sequence of initial bits) that helps to delineate the burst from the preceding transmission silence and helps the receiver synchronize with the sender's transmission. The novel preamble of the '444 Patent allows for messages to be framed and delimited from silence.

The '444 patent describes various enhancements to the transmission of the preamble, and includes various ways to increase the effectiveness of the preamble: (1) encode the preamble at a lower data rate than the subsequent data; (2) transmit the preamble at the same or higher signal power level than the subsequent data; and (3) include in the preamble link control information to be used by the remote modem receiver and transmitter. The goal of these enhancements is to, "significantly increase the probability that the decoder will decode the preamble symbols error free." '444 Patent Abstract.

1.   Communication Link Control Information

One approach described in the '444 Patent to enhance the ability to receive and decode a transmitted frame of data is to add communication link control information to the preamble. Neither the claim language nor the specification limits the type of communication link control information. Accordingly, the term "communication link control information" should be construed as it would be understood by a person of ordinary skill in the art. R 149-51, ¶¶ 41-44. Defendants' proposed construction unjustifiably narrows the claim's scope by requiring that the communication include a defined list of specific types of information, including transmit rate, maximum receive rate, and address. This information which Defendants would require in the

claim is specifically listed in the '444 Patent as exemplary. Figure 3B illustrates an "exemplar preamble." 9:35-36.

Some of the information that Defendants include in the "communication link control information" is included in dependent claims (e.g., claims 4, 15 "maximum receive rate"; claims 5, 16: "format of data"). By virtue of claim differentiation, the proper construction of this term should therefore preclude those additional restrictive terms. Furthermore, Defendants propose the same construction for the two terms "communication link control information" and "a plurality of bits representing communication link control information." Rembrandt, however, proposes a construction for the second term reflecting the additional words "a plurality of bits representing. . . ." The two terms should be construed differently to account for their different scope.

2.   Maximum Transmission Rates

Rembrandt requests construction of the term "maximum rate capable of being transmitted over a communication channel/ maximum rate capable of being supported over a communication channel." Defendants again attempt to insert limitations that are not part of the claim language. Neither the claims nor the specification require that the maximum rate be "specified" in the preamble. This proposed additional limitation is therefore improper.

Rembrandt's construction is consistent with the scope of the claim and the specification. Abstract; 7:15-42 (referring to the bit per symbol rate at which the data portion of the message is normally sent). A person of ordinary skill in the art would understand this term to refer to the highest bit per symbol rate at which the data portion of the message is sent. R 151-53, ¶¶ 45-49.

3.   "The Preamble Operating to Frame the Message and to Delimit the Message from Silence"

Defendants' construction of this term argues that "the preamble includes a first symbol transmitted at a power level higher than all other preamble symbols to precisely identify the

beginning of the message." This requirement should fail in view of claim differentiation, because it would nullify, e.g., dependent claims 24 ("increasing the energy of the first symbol index to reliably indicate the beginning of the communication message") and 35. Moreover, the claim does not (1) require that certain symbols from the preamble to be transmitted at a higher power; (2) limit transmission at a higher power solely to the first symbol; or (3) require that the first symbol "precisely identify" the beginning of the message.

Defendants' construction also requires that the preamble includes "communication link control information used to precisely identify the end of the message". This requirement is contrary to the teachings of the '444 Patent, which teaches a way to identify the end of a message – but not using the preamble. Instead, this is done by an encoding of the message data. See, e.g., Abstract; 3:13-21, 3:32-39, Fig. 3A; 8:24-25 ("The extra bit … indicates whether or not the cell just started …. is the last cell of the transmission"). But nothing in the '444 Patent teaches or in any way suggests that the preamble contains any information about the *end* of the message.

Rembrandt's proposed construction is consistent with the language of the claim. It defines "preamble" for the jury as the term is used in the context of data packets (which Defendants' proposal fails to do) while recognizing that most of the remainder of the language in the claim relies on ordinary terms and therefore need not be construed by the Court.

4.   Means for Applying a Preamble to a Communication Message . . .

Rembrandt and Defendants agree that the function of this term is "applying a preamble to a communication message." However, Defendants do not stop there. Instead, they add claim limitations that do not define the function of term.

Rembrandt's designation of the structure corresponding to the recited function is limited to what is necessary to perform the corresponding function. *See Cardiac Pacemakers, Inc.*, 296 F.3d at 1113. The two structures needed to perform the function are a sequencer and a

multiplexer (elements 236 and 224). R 153, ¶ 50. Defendants seek to incorporate large swaths of the patent disclosure that are unnecessary to perform the function. Defendants have identified structures that are unrelated to the function of "applying a preamble to a communication message," including structures relating to the message format (element 201); remote address (element 202), receive rate (element 204), and transmit rate (element 206). R 153-54, ¶ 51.

5.   Means for Encoding the Preamble Bits into a Plurality of Symbol Indices, . . .

Rembrandt and Defendants agree that the function of this term is "encoding the preamble bits into a plurality of symbol indices." But Defendants again ask the Court to inject limitations that are not part of the function of the term.

With respect to the structure, Rembrandt and Defendants both identify the preamble encoder (element 219). However, Defendants improperly attempt to read the "2 bit per symbol preamble encoder" example in the specification as a claim limitation. The claims contain no such limitation, and Defendants ignore the express statement in the specification that the 2 bit per symbol rate is merely an example: "For purposes of illustration only, the symbols that encode the bits in the preamble 40 shown in FIG. 3A are encoded at a rate of two (2) bits per symbol. However, any number of bits per symbol lower than that of the normally transmitted data rate can be used so long as the symbol rate allows a receiving device to more reliably decode those symbols." 7:25-30. The Court should reject Defendants' proposed structure.

D.   The '858 Patent (R 210-220)

Time Division Multiplexing (TDM) is a technique whereby multiple data sources transmit data over a single network connection. The mechanism described in the '858 allows two different types of data sources—(1) "synchronous" data sources, which output data at a constant rate, and (2) "packet" data sources, which output data at a "variable rate" – to agree among themselves how to allocate time slots on a TDM bus. 1:8-11. In accordance with

embodiments of the patent, multiple packet data sources are operatively connected to a TDM

bus. The TDM bus is also connected to a "network access manager" (NAM), which connects the

TDM bus to a wider network.

The bandwidth of the TDM bus is partitioned into regular time slots, which help to

delineate "channels" on the bus. For each segment of time – called a "frame" – certain timeslots

are reserved for the transmission of "packet" data. These timeslots form a "multiple access

packet channel," which acts as a single, common channel shared by the packet sources. 4:56-

5:12. Remaining timeslots form channels for transmission of "synchronous" data. 5:10-12. Fig.

5 shows, schematically, this division of the bandwidth. Time slots on the left side are assigned to

the multiple access packet channel, while time slots on the right-hand side may be assigned to

synchronous data channels. A "distributed packet manager" within each packet data source is

used to support sharing of the multiple packet channel(s) among the packet data sources. 6:6-14.

1.   Time-Division Multiplexed Bus

Rembrandt's proposed construction is consistent with the '858 Patent's specification and

a plain and ordinary reading of the claim term. R 154, ¶ 52. It accurately defines the technical

concepts "multiplexed" (shared by two or more sources of data) and "time-division" (limiting

each sources transmission to discrete intervals of time).

Defendants improperly add language ("whereby only one device can successfully

transmit over the bus at any one time") that is both not mandated by the specification and

inconsistent with the term as it is understood by those skilled in the art. The '858 Patent

expressly describes a bus which can support simultaneous transmission of packet-data and

synchronous data. 2:49-53; 3:39-61; Fig. 3; Fig. 5. Even within the portion of the bus that is

used for packet-data transmission, the patent contemplates an allocation of bandwidth by

separating the bus into multiple logical channels, and with such an allocation, two or more

devices (associated with different channels) may be transmitting over the bus at the same time. 11:12-15 ("Also, because the bandwidth of a TDM bus may be divided into many separate logical channels, data with different formats and access methods, such as isochronous and packet data, may be combined in the system."). Moreover, Claim 9 contains both the requirement of a TDM bus and the requirement that a portion of the bandwidth is "shared in such a way that only one of the plurality of packet data sources accesses the second portion of the predefined bandwidth at a time." 12:51-54. Defendants' proposed construction would improperly render this separate limitation in Claim 9 redundant.

2.   Packet Data

Rembrandt construes "packet data" as it is expressly defined in the '858 Patent. 1:8-11 ("…both synchronous data and *variable-bit-rate data … (hereafter referred to as packet data)*"). Defendants' construction improperly ignores the express definition in the specification.

"The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication." *Vitronics Corp.,* 90 F.3d at 1582. It is black letter law that a patentee can "choose to be his or her own lexicographer by clearly setting forth an explicit definition for a claim term that could differ in scope from that which would be afforded by its ordinary meaning." *Rexnord Corp. v. Laitram Corp.,* 274 F.3d 1336, 1342 (Fed. Cir. 2001). "The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication." *Vitronics Corp.,* 90 F.3d at 1582.

3.   Synchronous Data

Synchronous data are contrasted with packet data in the '858 patent, and so should have a distinct meaning. 1:20 (discussing "two types of data: synchronous data and packet data."). Whereas "packet data" refers to data with a variable bit rate, "synchronous data" should be construed to mean "constant bit rate data." As set forth above, the patent itself sets out an express definition for packet data as "variable bit rate data." This same intrinsic evidence supports a

definition of synchronous data as "constant bit rate data." Newton's Telecom Dictionary defines synchronous as data transmissions with "a constant time between successive bits, characters or events." R133. According to the patent, synchronous data supports "the ability to make telephone, i.e., voice calls." 1:21-22. Voice calls require constant bit rate access to the bus to minimize gaps in the signal that might degrade the quality of the call. R154-55, ¶ 53-55.

4. Terms Involving "Bandwidth" and Portions thereof

Rembrandt' proposed definitions of these terms are consistent with the ordinary meaning of the term "bandwidth" and with its usage in the '858 Patent. Having defined the term "bandwidth" (as an amount of data that can be carried in a unit of time), Rembrandt's constructions give proper meaning to the various "portions" thereof (e.g., "*one or more time slots* of the bandwidth"), a *predefined* bandwidth ("a *predefined* amount of data that can be carried in a unit of time"), as well as "a portion of a predefined bandwidth", "a first portion of the predefined bandwidth", and so on.

Rembrandt's definitions are well-supported by the intrinsic evidence. In several places the '858 Patent expressly ties portions of bandwidth to a number of time slots, e.g., a "portion of the bandwidth, or time-slots, of the TDM bus is allocated . . . ." Abstract; *see also* 5:15-18 ("[t]he time-slots allocated by NAM 205 to the packet application modules are the 'multiple-access packet channel.'"); 5:60-61 ("Time-slots 1-6 represent the 'multiple-access packet channel.'"); 12:4-5 ("by counting time-slots of the allocated bandwidth").

Defendants' proposed constructions of the terms "portion" in various combinations with "bandwidth," e.g., ("first portion of the predefined bandwidth") add limitations inconsistent with the claim language. In the case of the term "predefined bandwidth," Defendants improperly add "first and second portions." In addition, Defendants' construction of every term that includes the words "portion" and "bandwidth" inserts a requirement that the bandwidth be "fixed at [or

during] initialization." Nothing in the intrinsic evidence supports such a limitation. Certainly the claims do not require that the predefined bandwidth be "fixed at initialization." Claims 7 and 9 reference "predefined" bandwidth, but even this language does not require that the bandwidth be defined at initialization, as the Defendants' argue. In addition, Claims 1 and 4 do not describe the term "bandwidth" as being "predefined" in any manner or at any particular time. Defendants' proposed additional limitation that any portion of the bandwidth be "fixed at initialization" should be rejected everywhere it is used.

5.   **"Portion"**

Defendants request construction of the term "portion" (this in addition to various terms that include the word "portion", e.g., "… portion of the [predefined] bandwidth …"). Rembrandt believes that the word "portion" requires no construction by the Court. In the alternative, however, Rembrandt proposes "a part of a whole." This is consistent with the intrinsic evidence (which never limits a "portion" to less than the full bandwidth) and with the ordinary meaning of the term.

Indeed, the patent encompasses situations where both synchronous and packet sources are present on a TDM bus (and so neither would have the full bandwidth), *and* situations in which only packet sources are on a TDM bus (and so can take up the full bandwidth). Although Fig. 5 depicts only part (time slots 1-6) of the TDM bus allocated to packet data, the '858 Patent makes clear that the other time slots may also be *used for packet data*. 11:6-17 ("more than one 'multiple-access packet channel' can exist …[with] time-slots 1-6 … [and], e.g., time-slots 7-12, for transmitting packet data").

6.   **"Distributed Packet Manager"**

Both parties request construction of the term "distributed packet manager". The meaning of this term is clear from the intrinsic evidence. *See* Fig. 4 (disclosing example of a packet manager) and 6:65-10:10 (discussing how the packet manager controls its data source's access to

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the bandwidth). The concept that the manager be "distributed", is captured in the definition by requiring that each individual source have its own distributed packet manager.

Once again, the Defendants' proposed construction is unnecessarily cumbersome and adds limitations not found in the claim or required by the specification: specifically, Defendants' addition of the limitation "without the need for a centralized packet manager" is not justified. Further, Defendants' add the limitation that the packet source "communicat[e] with other packet data sources to control which one of the plurality of packet data sources can attempt to access the second portion of the predefined bandwidth at any one time" incorporates functionality that is not essential to the component in every embodiment. This limitation is contrary to a preferred embodiment in which a distributed packet manager attempts to access the bus not by communicating with another distributed packet manager but by "wait[ing] for its ID number to equal the count or ID number of the bit-time slot to attempt to access TDM bus 204-o." 7:66 – 8:2.

7.   Network Access Manager (Module)

Claim 8 requires that the data communication device further include "a network access manager coupled to the time division multiplexed bus for communicating the synchronous data and the packet data to at least one network facility." The specification discloses two functions for the network access manager. First, it interfaces with a wider network, as shown, e.g., in Fig. 3. Second, the network access manager "controls time-slot allocation among the synchronous modules and the packet modules." 5:11-13. The specification states that the network access module "controls time-slot allocation among the synchronous modules and the packet modules" and "provides the interface between the TDM bus and network facility." 5:12-13; 3:46-47.

Defendants' additional limitation that the network access manager be limited to a "network access unit" should be rejected as contrary to a plain reading of the claim 7, from which claim 8 depends. Claim 7 is not limited to a network access unit but more broadly claims a "communication apparatus."

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8.   Data Communications Apparatus/Equipment

The '858 claims variously recite "Data communications apparatus" (claim 1); "Communications apparatus" (claims 7-11); "…in … data communications apparatus. …" (claim 15) and "… in … data communications equipment …" (claims 20, 26).   Although Rembrandt does not believe that these terms require construction, in response to the Defendants' position Rembrandt proposes: "data communications apparatus."

The terms "apparatus" and "equipment" are both plural and singular, and the claims specifically use the terms in their plural sense. Defendants' construction improperly requires all components of the claim to be in a single device, ignoring the specific language of the claims. *See* Claim 1 (recites "Data communications apparatus comprising …." and not "<u>A</u> data communications apparatus comprising …"). The specification also does not require that the various apparatus be in a single device. Figure 3 shows exemplary "apparatus" embodying the principles of the invention, logically collected as a NAU with a dashed line drawn around the various apparatus. The '858 Patent does not, however, describe an NAU as being a single device nor does it require it to be one. To the contrary, a NAU is described as an "architecture" 1:56.

Defendants' definition also alters the plain meaning of the term by emphasizing network "access" rather than "communications."   This is needlessly confusing and creates limitations where none exists in the claims. Defendants' definition also narrows the scope of the term by requiring that it facilitate communication between two specified elements of a network—a "local network" and a "network facility." This again is an unsupported limitation and the additional terms render the term more confusing and ambiguous than the original claim language being construed.

9.   Bus

The specification indicates that the term "bus" was used in the plain and ordinary meaning of "one or more conductors that are used as a path for transmitting information from

any of several sources to any of several destinations." 2:57-65. Defendants' proposed construction that the bus is used for data transfer "among components" of a single "device" is contrary to the common definition of this well-understood term. R 155-56, ¶¶ 56-57. As discussed above, nothing in the patent requires that the various components be located in any particular place, let alone in the same device. This same argument applies to the bus. Defendants' attempt to import this limitation on the patent through the term "bus" should be rejected.

10.   A Plurality of Packet Data Sources

Rembrandt's proposed definitions of these terms are consistent with the plain meaning of the claim language and the intrinsic evidence. *See*, *e.g.*, Fig. 3; 4:56-5:10.

Defendants again import the requirement that there be no central packet manager. As earlier discussed, this limitation is not part of the claim language. Defendants add the further limitation that the packet sources each share the bandwidth "by contending for the use of entire channel in which no time slot is assigned to any particular packet data source." This limitation would erroneously mandate that a packet data source could only access the entire allotted bandwidth, and no fewer timeslots, which is contrary to the patent's teachings that the packet data source "may send any prescribed number of packets" and could even "limit this number to one." 10:12-17.

Defendants also posit the additional limitation that "no time slot is assigned to any particular packet data source." This limitation, also nowhere found in the claim, is also contrary to at least one '858 preferred embodiment in which a time slot is assigned to each packet source in order for it to request access to the bandwidth.[9]

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[9]   "FIG. 6 shows an illustrative slotted-access method. There is an implied numbering of the packet application modules and "bit time-slots." This implied numbering is hereafter referred to as an "ID number." Generally speaking, a packet application module can attempt to access TDM bus 204-o only when the ID number of the "bit time-slot" matches the ID number of the packet application module."

Finally, the Defendants construction of "a packet data source" as "a circuit board" should be rejected because the claim does not recite a "packet circuit board." This is simply another of Defendants' improper attempts to limit the claim to an exemplary embodiment. That a packet data source is merely that, a source of packet data, is expressly supported by the claim language.

11. "Interface Circuitry"

Claim 10 introduces the term "interface circuitry… for synchronizing packet data to the time division multiplexed bus." Rembrandt's construction is consistent with the express claim language and specification.[10]

Defendants add the following additional limitations: "without the need for a centralized packet manager, by communicating with other packet data sources to control which one of the plurality of packet data sources can attempt to access the allotted bandwidth at any one time." Because the claim includes none of those limitations, they should be rejected for the reasons previously discussed.

12. "Counter"

While Rembrandt does not believe this term requires any construction, Rembrandt proposes the following in accordance with a plain reading of this claim language: "a device that measures time slots in the second portion of the predefined bandwidth."

Defendants' proposal again includes unsupportable limitations--that the counter "counts only the time slots in the second portion of the predefined bandwidth." Nothing in the claim or the specification suggests that the mechanism used to count the time slots cannot also serve other functions. This limitation should not be read into the patent.

13. "Controlling access …" and "transmitting packet data …"

7:25-31.

[10] The specification states: "[i]n accordance with the principles of the invention, packet/TDM interface 310 synchronizes packet data retrieved from buffer 315 for insertion into an appropriate time slot on TDM bus 204." 4:25-28.

These claims use terms that are either defined elsewhere or use their plain ordinary meaning. Defendants', however, have proposed constructions that would alter the plain meaning of these claim terms.

The parties' dispute over "controlling access …" turns on two issues. First, Defendants again attempt to insert a limitation prohibiting the use of a centralized packet manager. Though the claims require a distributed packet manager, they do not preclude the existence of a centralized packet manager for some functions. *See* discussion at § III.D.6. Second, Defendants' construction requires that only one of the packet data sources can *attempt to* access the allotted bandwidth at a given time. In fact, no such limitation exists in the claims or the specification and there is no language in this claim term that justifies insertion of such a limitation here.

Defendants attempt to insert a similar limitation into "transmitting packet data …", again without support from the patent. Defendants' construction would permit "only one" of the packet sources to "transmit packet-data" or to "have access the bandwidth channel" at a given time. This imported limitation should not be read into the claim language, which by its plain meaning suggests no such restriction. The patent contemplates more than one channel, and more than one packet source could be simultaneously transmitting on the channel.

E.   The '819 Patent[11] (R 220-28)

Information takes time to travel between nodes of a network. In a network (e.g., a TDM network) where a central node communicates with various remote nodes, this travel time can be affected by various factors (e.g., varying distances between nodes, transmission delays or "latency"). The potential for transmission delays creates inefficiencies in networks, and information about the latencies and delays help to reduce these inefficiencies. Ranging is a

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[11]   The '819 Patent was asserted in the Texas case, where 10 terms were disputed. Defendants now dispute an additional 13 terms.

mechanism by which the network can determine latency for each remote unit.

The '819 patent discloses an improved ranging mechanism for nodes on a TDM network with multiple applications running over the network. According to the specification, the patented system compensates for transmission delays by "ranging or measuring the round-trip transmission or delay time between the master unit and each remote unit." 2:10-12. This range is "transmitted from the master unit to the remote units," and the remote units adjust the timing of their transmissions so that data is received at the master unit as if it were sent without delay. 5:40-42. The '819 invention reduces empty "guard" times between transmissions, thereby making more efficient use of the network. The system allows multiple applications to be employed on the network with no fundamental limit on number of applications and without extensive maintenance engineering. 1:1 – 2: 35.

1.   Application Program[s]

Neither the claim language nor the specification limits the specific type of application programs, other that to specify in the claim that "each of [the] remote units execute at least one application program, and at least one of the remote units execute at least two application programs." Claim 1. Accordingly, the term should be given its construction as understood by a person of ordinary skill in the art, as Rembrandt has proposed. R 156-58, ¶¶ 58-59. Defendants' construction identifies exemplary programs ("payroll, inventory control, word processing, accounting, spreadsheet, etc."), but the intrinsic evidence does not require a particular type of application program. Defendants' construction also improperly adds the limitation that the program "*directly* meets the needs of a user." This limitation is not in the claim language or the specification and should be rejected.

2.   "Time Slot" and Related Terms

Rembrandt believes that these terms rely primarily on common words using their ordinary meaning and require no construction by the Court. However, solely in response to

Defendants' constructions, Rembrandt has offered constructions that do not needlessly stray from the claim language, while explaining some technical concepts that may appear complex.

The context of the claims makes it clear that the term "subframe" represents a portion of a time period. The term should therefore require no construction by the Court. Defendants' construction improperly imports the limitation that the subframe begin and end within one frame or that it be "assigned by a user to a single remote unit" on the network. This limitation is not required and therefore should be rejected. Defendants also attempt to smuggle in limitations requiring that each application be assigned *only one* time slot per subframe, that subframes and time slot assignments repeat from frame to frame, and that a user assign a time slot to an application, none of which appears in the claim language being construed. The specification does not require that the subframe be assigned to a unit, 4:55-62, and does not require time slot assignments to be repeated from frame to frame. The specification's discussion of a user preferably assigning time slots is an example—not a claim limitation.

3. Reservation Request Generator/Reservation Request Processor

Rembrandt's constructions of these terms are consistent with the intrinsic evidence. A "reservation request," is a request to obtain additional time slots. Rembrandt's proposed definition uses plain language to define this limitation, whereas Defendants' construction is needlessly complex. Defendants' constructions again add multiple limitations not found in the claim or required by the specification, including (i) that the reservation request generator "monitors a compression buffer;" (ii) for the creation of an "initialization parameter table" containing a "preset parameter limit" which is used by the reservation request generator to determine when additional time-slots are needed; (iii) that the reservation request generator "senses" whether an application needs additional time slots; or (iv) that the reservation request bit "request use of time slots assigned to subsequent remote units for the remainder of the message" (the claim actually more broadly specifies that the reservation request bit requests "an

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additional time interval.").

Defendants' construction of "reservation request processor … bit" actually describes a different function from the one claimed. Under Defendants' proposed definition, one function of the reservation request processor is "to allow a remote unit to request…"[12] However, the request does not "allow" the *making* of a request; it *processes* those requests once they have been made.

4.   Priority Bit

The parties agree that "priority bit" should be defined as a bit used to convey the relative importance of an item. Rembrandt contends that the item given priority must be a "communication," whereas Defendants' misleadingly, and incorrectly, assign relative importance to the units connected to the network. This construction is erroneous. Defendants also add two more limitations requiring that the priority bit be set "by the user" and "at initialization". Nothing in the claims supports these limitations.

5.   Master Unit/Remote Unit

Rembrandt's proposed construction of each of these terms is consistent with the broad language of the claim term in accordance with the '819 specification. Defendants again insert limitations not found in the in the language of the asserted claims or required by the '819 patent. For example, Defendants require that the transmitting step of claim 14 take place during initialization. No such requirement is found in that claim. Similarly, Defendants' construction requires communications from the master unit to be sent "without packet headers or delimiters." Although master units on networks *may* communicate using such a protocol, it is not required by the claim language and should not be imported as a limitation here.

6.   Master Network Timing Means

The parties agree that the "master network timing means" is not a means plus function claim element but rather a reference to the network timing control processor or other timing

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[12]   This implies that that the reservation request processor must grant permission to the reservation request generator before the latter can activate a reservation request bit.

mechanism used by the master unit. Rembrandt's proposed definition captures the meaning of the claim term without either expanding or adding limitations to the patent. Defendants seek to impose a limitation related to user initialization and storage requirements. The claim language does not refer to initialization and this limitation is not mandated by the intrinsic evidence.

7.   Ranging Means

The parties dispute whether the term ranging means is a means plus function element. Just as the parties a the term "master network timing means" discussed above, the use of the word "means" at several points in the '819 patent claims was not intended to implicate 35 USC § 112, ¶6 because none of these claims assert "means for" followed by the description of a function. Rather, the word "means" is used to name a device or process identified in the claim. Here, the claim uses "ranging means" to describe the device that determines the transmission time between the master unit and a remote unit.

Should the Court conclude that 35 USC § 112 ¶ 6 applies, Defendants' construction of the function and structure of the term is incorrect. Contrary to Defendants' construction, the use to which the remote units put the range information is <u>not</u> part of the function of the ranging means. In addition, the structure identified by Defendants is unnecessary to the function because it is defined as operating during initialization and before the remote units transmit data.[13]

8.   "Transmitting"

Rembrandt does not believe that this term requires construction by the Court. If it is construed, the Court should use terms, as Rembrandt has proposed, which closely follow the claim language. Again, Defendants insert a limitation requiring that certain procedures be performed "during the initialization process," a limitation not found anywhere in the claim

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[13]   Thus, should the Court agree with Defendants that this limitation is governed by 35 U.S.C. § 112, ¶ 6, Rembrandt would construe the function to be ranging or determining the transit time between the master unit and a remote unit, and the corresponding structure to be the Network Timing Control Processor 12, Ranging and Network Initialization Generator 20, and Ranging Receiver 32 shown in figures 1 and 3 and described at 1:63-2:17; 2:57-3:6; 3:25-29; 3:42-49; 4:62-5:3; 5:24-34; and 6:32-36.

language or justified by intrinsic evidence.

    F.   **The '903 Patent (R 228-236)**

The '903 patent relates to improving communications between communications devices on a network by reducing the impact of "noise" in communications channels. The '903 patent describes reducing signal losses attributable to noise by compensating, based on the level of noise present in the channel. The patent teaches: (a) calculating a noise spectrum for a signal received from a transmitter; and (b) generating parameters based on the noise spectrum that can be used by the transmitter to adjust the output signal, thereby compensating for losses attributable to the noise.

    1.   **"Noise Spectrum"**

Rembrandt's proposed construction of "noise spectrum" as "noise signal values" is consistent with the claim language and the specification. Fig. 4 shows an exemplary noise spectrum generator circuit 50. The input to the box "Complex DFT" 68 in Fig. 4 is a noise spectrum (in the time domain), and the output of the DFT 68 is the noise spectrum (now in the frequency domain). 3:42-46 ("Complex DFT block 68 converts the … noise signals in the time domain … into the noise spectrum in the frequency domain."). Regardless of the domain in which the noise is represented, it is still a noise spectrum—nothing in the specification limits the noise spectrum to a particular domain or format. In fact, the output of the comparator 64 is also a "noise spectrum": "Comparator 64 … calculate[s] an error signal … representative of the noise signal," 3:31-33, and claim 5 describes a comparing means (e.g., comparator 64) as calculating a noise spectrum. Defendants' propose a construction that limits the noise spectrum to the frequency domain and even more specifically to "a range of frequencies." Defendants' proposed construction is unnecessarily restrictive and ignores the specific teaching of the specification and the claims.

2.   **"generating parameters responsive to said noise spectrum of said output;" and "calculating a noise spectrum of said output"**

Defendants' construction ignores the description that the parameters are "responsive to" the noise spectrum. Defendants state that the parameters can be generated more loosely "by choosing points of a noise spectrum." The patent is clear, though, that the generated parameters be "based upon" the noise spectrum. '903 abstract. The preferred embodiment supports Rembrandt's construction by describing parameters generated through a <u>calculation</u> (by "applying a discrete Fourier transform") that "converts" the noise signals from the time domain to the frequency domain, 3:30-45, and not simply by "choosing." Moreover, Defendants' construction of this these terms relies on their construction of "noise spectrum," which itself is not consistent with the specification and claim language.

3.   **adjusting frequency characteristics of output from said transmitting step responsive to the pre-emphasis coefficients**

This claim term relies on the ordinary meanings of words, albeit in a specialized context, and therefore does not require significant interpretation by the Court. Defendants' construction distorts the plain meaning of the term by appending a requirement that the adjustment be performed "so that the signal to be input into the receiving modem has a constant signal to noise ratio across all frequencies whether the noise is injected before or after the high frequency roll-off of a communications line." This limitation appears nowhere in the claim language and should be rejected by the Court.

4.   **First Transmitting Means**

The parties agree that the term "first transmitting means" is not a "means plus function" term, but rather a name that identifies the transmitter in the transmitting modem. Defendants propose, however, the additional limitation that the transmitter be "conventional," which is ambiguous and neither required by the claim language nor the specification.

5.   **Means Plus Function Terms**

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Claim term: "adjusting means responsive to the pre-emphasis coefficients for adjusting frequency dependent characteristics of an output of said first transmitting means."

Function: The parties disagree on the function of the adjusting means. Rembrandt says that it is an "output signal", and adds the limitation--from the claim language itself--that the adjusting be "based upon the pre-emphasis coefficients."

Structure: Rembrandt proposes the necessary structure described in the specification (a pre-filter, 16 in Fig. 5). Defendants propose a specific implementation of a pre-filter **and** a *conventional* modem transmitter, even though the "adjusting means" does not include "transmitting means", and with no justification for the unhelpful term "conventional".

Claim term: "receiving means for receiving said output from said first transmitting means"

Function: The parties agree that the function is "to receive the output from the transmitter."

Structure: Rembrandt contends that the structure necessary to carry out this function is a receiver. Fig. 5, element RX between elements 22 and 24. Defendants appear to agree.

Claim term: "generating means for generating parameters responsive to a noise spectrum of said output"

Function: Rembrandt asserts that the claimed function is self-explanatory "generating parameters responsive to a noise spectrum of the output signal." Defendants argue that the function should be "generating parameters by choosing points of a noise spectrum of said output." Defendants again insert the misleading concept that parameters must be "chosen". This concept is found nowhere in the patent and should be rejected as discussed above.

Structure: Rembrandt contends that the preferred structure disclosed by the patent for this function is "a discrete Fourier transform circuit, or the equivalents." FIG. 4 (68); 3:41-45; 4:55-56. Defendants attempt to severely narrow the proper scope of this claim by importing additional limitations from the specification. They argue that the patent requires the structure to

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be: "a noise spectrum generator circuit, including complex DFT block that calculates a frequency domain plot of the noise signal at 709, 1145, 1800, 2455, and 2891 Hertz chosen from a 22 point discrete Fourier transform." None of these structures are required to perform the function of the term.

Claim term: "means for calculating said noise spectrum of said output."

Function: The language describing the function does not require further interpretation by the Court and should be construed simply as "calculating said noise spectrum of said output." Defendants' argue that the function is "calculating noise signals of said output in the time domain and converting them into a spectrum in the frequency domain."   Defendants again confuse the calculation of the noise spectrum with a translation of the already determined noise spectrum into a new domain (the frequency domain).   The function of this term is only to calculate the noise spectrum and not to perform any other functions or additional steps, in particular, that the noise spectrum should be calculated in any particular domain and that the noise spectrum should be converted to any other domain.

Structure: The structure necessary to perform this function is noise spectrum generator circuitry. Fig. 4, (element 50); FIG. 5 (element 24). Defendants' agree that this circuitry must be included in the structure, but argue that the Court should also include equalizers 56 & 57, phase corrector 60, slicer 62, comparator 64, inverse phase corrector 66, and block 68 that perform a 22 point discrete Fourier transformation calculation. These elements perform the conversion calculation (time domain to frequency domain) discussed above and are not used in calculating the noise spectrum itself.

Claim term: "second transmitting means for transmitting said parameters to the transmitting modem"

Function: The parties agree: transmitting parameters to the modem.

Structure: Rembrandt contends that the necessary structure is a second transmitter. Fig.

5, element 38. Defendants yet again seek to import limitations from the specification, arguing that the necessary structure is "*low rate* secondary channel transmitter that transmits on a *sideband* of the primary channel at a low transmission rate via digital-to-analog converter." Because the claimed function is transmitting parameters to a modem, not transmitting at a specified "low rate" or on a sideband, Defendants' construction is impermissibly narrow.

Claim term: "computing means for computing the pre-emphasis coefficients from said parameters."

Function: The parties generally agree that the function of the computing means is computing the pre-emphasis coefficients from the parameters. Defendants further assert that the computing means must be in the transmitting modem, with no support from the claim language.

Structure: In requiring that the computing means be found in the *transmitting* modem, Defendants' construction includes a location restriction that is not present in the claim or required by the specification. Defendants also include far more structure than is needed to perform the function. For example, Defendants have identified "multiplier 30 that divides the output of the comparator" – even though the specification teaches that "… division by two is optional and not crucial to the invention. The reference spectrum may be divided by other values, or not divided at all, in other embodiments of the invention." 4:25-27. Additional structures identified by the Defendants as required are not specifically necessary to perform the stated function, but fall into the category of equivalent structures that could perform the recited function.

G.   The '159 and '234 Patents (R 237-51)

The '234 patent is a divisional of the '159 patent. Both patents describe remotely updating a stored program controlled apparatus, '159: 1:1-5, which stores the programs that are executed to run the device. R 158-59, ¶¶ 60-61. Examples of such devices include supermarket check-out terminals and modems. *Id.* Because the programs are stored within the device, the

consumer is not bothered with the task of installing software to use the device. *Id.* However, in most cases, the device's stored programs eventually must be updated. *Id.* at ¶ 63. While the '159 and '234 patents do not require that the entire set of stored programs be updated, the inventions claim a novel system and method that allows remote updating of stored programs. '159: 1:1-5, 1:49-67; 2:1-4.

1.   The '159 Patent Does Not Require That Every Program in the System be Stored In or Executed From the "Program Memory"

Defendants' construction of "said memory being the only program . . ." and "program memory" improperly requires that all programs in the system execute from the program memory. That limitation is not required by the claim language or the specification. The invention describes a system capable of storing programs in memory. 1:1-5; 1:37-47; Claims 1 and 6. The patent distinguishes between general memory found in the system and memory that stores the system's initialization programs. Claims 1 and 6; 1:49-59; 2:47-50; and Fig. 1. Part of the invention's novelty relates to a system's ability to accommodate a remote update of program segments that are stored in non-volatile memory—program memory. *Id.* Other program segments may be stored in and/or executed from other memory of the system. *Id.* Throughout the specification, the patent makes clear that some program segments are stored in "program memory" and other segments are stored in other memory locations. 3:64-66 ("After the new EP set is installed in memory locations X through X+N…memory locations that serve as soft-ware defined registers…are populated with data…."); 4:59 ("download the remainder of programs into memory 20."; "whether to store the received data in memory 20 or *elsewhere*"). Not every program must execute from program memory or non-volatile memory. 3:1-4. ("It should be understood that line 12 in the FIG. 1 architecture effectively offers a 'remote execution' capability to processor 10, in that the programs which are executed by processor 10 are affected by data supplied by line 12.").

2.   The '159 and '234 Patents Claim Memory That May Be Volatile

Defendants incorrectly import into several constructions[14] the limitation that all memory in the system must be non-volatile memory; however, the specification specifically contemplates the use of volatile memory: 4:44-45 ("Register 40 may be a volatile memory . . . .").

3.   Not All Programs of the '159 and '234 Must Be Executed From Non-Volatile Memory

Defendants import an incorrect limitation into several constructions[15] by requiring that all programs in the system be executed from non-volatile memory. The claims do not contain this limitation and the specification supports the use of volatile memory to download and execute programs. 4:60-62 ("[D]uring the copy sequence (which may also be a 'move' sequence) the arrangement is vulnerable to power failures."). It is well known in the art that the contents of volatile memory are vulnerable to power failures; the contents of non-volatile memory are not. R 159-60, ¶¶ 62-65.   Additionally, "the apparatus employing the principles of this invention does not need to have a non-volatile 'boot-up' read-only-memory." 2:41-43. *See also* '159 § G.1, 2, supra. Rembrandt requests that the Court remove the unsupported limitations of "non-volatile" and "executed" from Defendants' various constructions, as well as the importation of extraneous limitations not found within the claims or specification, as discussed below.

Defendants' construction of the term "alterable storage means for holding a displacement multi-bit address . . . that controls the starting address accessed by the processor when initialized/[initializing]," limits the structure to non-volatile memory; however, the specification gives an example of when the starting address is located in volatile memory: "[T]o protect against this unlikely event, the power source can be designed to have sufficient reserve to…protect the starting address." 4:60-66.

Defendants add to the term "Means for receiving a trigger signal . . . ." a limitation that

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[14] Terms 104-107, 109-114, 115, 116, 118-121, 123, 124, 126-133, 135, 138, and 139. R 237-51.
[15] Terms 109-114, 118, 1119, 120, 121, 127-133, 135, 138, and 139. R 238-51.

the system must execute programs (that need to be executed when the system is powered on or rebooted) from non-volatile memory; and further assumes that these programs are stored in non-volatile memory.

4.   The Processor and Communications Port May Contain Memory and May Store Information Received Through the Communication Port

When construing terms to describe remote communication through the communication port,[16] Defendants improperly limit the type of data that may be received, as well as the method by requiring that all data be downloaded into non-volatile memory.

In construing the term "communication[s] port coupled to said processor, said communication port being adapted to communicate with devices which are external to said system," Defendants also add the limitation that "the processor…receive[s] program data, commands, and other information from remote devices through the port *before any such information is stored in any memory*."

Defendants' limitation that the information is not stored in *any* memory is nonsensical; nothing in the patent indicates whether electronic information transmitted to the communications port was previously stored, and it is likely that at some point it was stored in memory. R 160-61, ¶¶ 66. Furthermore, several memory components in the claimed system, including the processor, Register 40, and other memory addresses may store the data (even temporarily) before it is stored (if that is the case) in non-volatile memory. '159 4:11-13 ("step **52** conditions processor **10** to account for the offset present in register 40 and loads the remainder of programs destined for memory **20** in addresses higher than X+N….").

5.   Additional Improper Limitations Imposed by Defendants

Defendants improperly add a limitation requiring that the term "a set of programs . . . that are executed when the system needs to be initialized," include programs that maintain

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[16] Terms 121-124, 126. R 245-47.

communications between the device and apparatus. But the specification distinguishes the latter as a separate set of programs. 1:51-54 ("That resident portion contains "boot-up" segments and program segments that are necessary to maintain the communication between the remote processor and the local equipment….").

Defendants improperly add to the term "said memory being completely updateable in its entirety but non-volatile" the ability for all contents to be erased at the same time during an update. This is misleading, as the specification does not state that all of the system's memory may be erased *all at once*—if it occurs, it describes steps or portions that are erased. 4:21-24 ("To install a new EP in such a memory…construct memory 20 from at least two distinct erasable memory blocks (distinct in the sense of being able to erase one and not the other).").

6.   The Claim Terms Describing the Downloading or Execution of Programs Do Not Require That The Newly Downloaded Programs be Immediately Executed

Defendants improperly add a limitation requiring the immediate execution of downloaded programs in the following terms: 132, 135, and 138. R 249-51. The specification and claims do not require the *immediate* execution of newly downloaded programs; furthermore, it is unclear what Defendants mean by this limitation. Contradicting the "immediate" requirement, the specification describes the option of employing several steps in remotely updating an apparatus by downloading new programs: "a step of moving, interposed between said step of altering operation of the apparatus and said step of installing the remaining programs…a second step of altering operation of said apparatus to execute the EP_{new} programs…by said step of moving." Claim 2, '234 5:49-57; "installing the EP_{new} programs…altering operation of said apparatus…moving the EP_{new} programs … installing the remaining programs…." '234 Claim 5, 6:31-41; "said step of altering operation of said apparatus to execute said EP_{new} programs is accomplished by installing an offset address to pass control of said apparatus to said EP_{new} programs." '234 Claim 8, 6:52-55. Rembrandt urges the Court to exclude this limitation, as well

as the improper limiting purpose, "so that communications can continue seamlessly", included in Defendants' construction of these terms.

7.   Remaining Means Plus Function Terms Are Properly Supported

Defendants claim that the '159 patent does not contain structure that supports the means plus function terms of the '159 patent. Despite this belief, Defendants cite to multiple structures in the specification for each term. Rembrandt contends that the means plus function terms are appropriately supported by structure as indicated in its claim construction, and that any additional structures cited by Defendants are extraneous.

IV.   CONCLUSION

Rembrandt respectfully urges the Court to adopt its proposed constructions.

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CERTIFICATE OF SERVICE

I hereby certify that on June 4, 2008, a true copy of the foregoing Rembrandt Technologies, LP's Opening Claim Opening Brief was served by (electronic email, facsimile transmission and/or First Class Mail) to the following persons and was electronically filed with the Clerk of the Court using CM/ECF which will send notification of such filing to the following and the document is available for viewing and downloading from CM/ECF.

/s/ Collins J. Seitz, Jr.   .